

## **REMARKS/ARGUMENTS**

Claims 1-28 are pending in the present application. Claims 1 and 18 have been amended to further clarify the “extraction” step described in sub-paragraph (c) thereof. The claim amendments are entirely supported by the application as filed, in particular by the teaching found at p. 5, last paragraph of the specification. Entry of the claim amendments into the file of this application is, therefore, respectfully requested.

### **Claim Rejections Under 35 U.S.C. §103**

Paragraph 2 on p. 2 of the Office Action states that claims 1-4, 6-12, 15, 16, 18-22, 27 and 28 are rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over USP 6,656,287 to Sanders (“Sanders”) in view of Schultheiss, et al., Processing of Sugar Beets With Pulsed-Electric Fields, IEEE Transactions on Plasma Science, Vol. 30, No. 4 (August 2002). Applicants believe that the Examiner additionally meant to include claims 13, 25 and 26 in the subject rejection due to the fact that bases for the rejection of the subject claims are set forth in ¶¶ 12 and 18 (i.e., on p. 5), respectively, of the Office Action. Thus, the Examiner’s rejection will be treated as if it also includes these additional claims.

The above-described claim rejections are respectfully traversed for the reasons set forth below.

Based on applicants’ review of the Office Action, it appears as if the Examiner has misunderstood the meaning of the ‘alkaline extraction treatment’ in sub-paragraph (c) of claim 1 and “extracting” as found in the corresponding sub-paragraph of claim 18. In an effort, therefore, to clarify this misunderstanding sub-paragraph (c) in both claim 1 and claim 18 has been amended as indicated above.

By way of explanation, the term “extraction” as used with regard to the claimed invention refers to the process of extraction in a ‘strict’ sense, namely as a physico-chemical separation method for dissolving out a fraction of particular constituents from solid or liquid substance mixtures using suitable solvents or so-called “extractants”. This definition entirely comports with the teachings contained at p. 5, last paragraph of applicants’ specification which, as noted above,

is relied upon as support for the amendments made herein to sub-paragraph (c) in claims 1 and 18. In addition, the meaning of the term as used by the inventors in the specification and claims of the present application corresponds with how the term is defined in any textbook of basic or analytical chemistry which one having ordinary skill in this art would be familiar with. For the Examiner's information, applicants submit that the term "extraction" as used with regard to the present invention also is synonymous with the terms "diffusion" or "diffusion extraction" as used in some cited prior art references.

As may be seen from the explanation above, the term "extraction" as used with regard to the present invention does not relate to 'extraction' in a broad sense (i.e., in the manner in which it appears to have been construed by the Examiner), i.e., as relating to separating off juice from biological material with the use of pressing, e.g., via a screw press. Applicants believe that the Examiner has inadvertently in her mind broadened the meaning of the term "extraction" beyond that which was intended by the inventors (note: the application was originally prepared in the German language, and then translated into English for filing, e.g., in the U.S. Patent Office) in light of its broader connotations in the English language as discussed above. To indicate a juice extraction by means other than 'diffusion' (involving dissolving desired materials with the use of at least one suitable solvent as intended by applicants) in the German language, the terms "preparation", "production", "recovery" or "isolation" would be used instead. The Examiner can, of course, see for herself that the present specification does not include such terms and, hence, the invention does not refer to such means.

Accordingly, the term "alkaline extraction treatment" as used, for example, in claim 1 is referring to an extraction carried out under alkaline conditions. This is generally accomplished through the addition of alkaline substances, in particular lime, to the biological material prior to extraction. Methods for doing so are well known in the prior art, including some of the references cited in an Information Disclosure Statement (IDS) filed concurrently with this Amendment, namely: Goodban, et al., Liming of Sugar Beet Cossettes (1964); Camirand, et al., Effects of Lime on the Chemistry of Sugarbeet Tissue (1981); Zaragosa, et al., Effect of Cossette Liming on Diffusion Juice (1982) and Bliesener, et al., Pressing of Cossettes After Alkaline Pretreatment

(1991). Such alkaline extraction is additionally described in the specification of the present application at from p. 11, second to last paragraph, to the end of p. 14.

It should be understood that the term 'alkaline extraction treatment' as used, for example, in applicants' claim 1 does not relate to any other 'type' of alkalinity, i.e., such as that which may occur after the juice has been extracted from the biological material. In connection with, for example, sugar beets the juice obtained from the above-described diffusion extraction process is typically referred to as "diffusion juice". It is known in the prior art to treat the diffusion juice with alkaline substances, lime in particular, to remove non-sucrose substances. This technique is typically referred to by those working in the field as 'liming' and/or as 'pre-liming'.

The following discussion of the prior art and of the features which distinguish applicants' claimed invention from such art, takes into account the meanings described above of the relevant terminology as included in applicants' specification and claims.

The Sanders U.S. '87 patent does not relate to an alkaline extraction treatment, i.e., involving a diffusion extraction under alkaline conditions as recited in, e.g., claim 1. Similarly, the patent (No. 6,387,186) to Reisig et al., cited by the Examiner on Form PTO-892 provided with the Office Action, also does not teach the diffusion extraction technique used by applicants in practicing the presently claimed invention. In fact, Reisig et al teaches away from the use of a conventional diffusion process (see, e.g., col. 1, lines 31-35 and col. 2, lines 5-8). Similarly, the Hunt patent (combined to reject claims 5, 14, 17 and 23-24, which rejection is discussed further below) teaches juice 'extraction' wherein the juice is obtained via a pressing technique. There is, however, no teaching in the above references with regard to "diffusion extraction", as discussed above. Thus, in any attempt to improve on diffusion extraction results, one having ordinary skill in this art would clearly not look to any of the Sanders, Reisig et al. or Hunt et al. references.

Schultheiss et al. relates to methods and means for isolating ingredients from biological material, in particular sugar beets, and teaches the step of electroporating the biological material prior to extraction. This is as recited in step (a) of claims 1 and 18. The reference, however, is entirely silent with regard to any step involving separating off the cell juice from the electroporated biological material before subjecting the material to a diffusion extraction treatment (see, e.g., step (b) in claims 1 and 18). The reference is also silent with regard to an

alkaline extraction treatment step (i.e., a ‘diffusion’ extraction) which is recited, in particular, in sub-paragraph (c) of claim 1.

As per the teachings contained in Reisig et al.(see col. 2, lines 5-8), the Schultheiss reference teaches to carry out the extraction by pressing as an alternative to diffusion extraction (see Schultheiss, p. 1549, right-hand column, second paragraph, first two lines (“Besides by cold pressing, the sugar beets treated in the KEA reaction chamber were extracted by diffusion in water.”)). The Schultheiss reference cannot be interpreted as teaching or even suggesting to, first, separate off cell juice from electroporated material and then to perform a diffusion extraction as a follow-up, without reliance upon hindsight initiated by a reliance upon applicants’ teachings as found in the specification and claims of the application presently under examination. This is due to the fact that the diffusion treatment as addressed in the subject reference is considered as, “the same sucrose extraction as in the standard procedure” (see, e.g., Schultheiss p. 1549, right-hand column, second paragraph, lines 2-3).

According to, for example, the Reisig et al. reference, pressing and diffusion are alternative approaches to be used for isolating juice from biological materials. Hence, diffusion without a preceding pressing step would be considered as “standard procedure”.

Even more importantly, however, the Schultheiss reference does not either teach or suggest the combination of electroporation with an alkaline extraction treatment as recited, e.g., in claim 1. The reference is entirely silent with regard to any kind of alkaline treatment step. As developed in detail in the Schultheiss reference, the electroporation step is used to provide the lysis of the cell membranes of the biological material (i.e., “The treatment of biological cells with strong pulsed electric fields can lead to irreversible formation of large pores in the cell membrane and thus destroy the cell and give access to its content.” (Abstract, lines 1-4)).

The reference teaches electroporation as an alternative to common thermal denaturation (i.e., involving the heating of the biological material before and/or during extraction (see, e.g., p. 1547, right-hand column, first three paragraphs). However, it is known from the prior art that alkaline pre-treatment, and liming in particular, of the biological material (sugar beets in particular), is an essential aspect of an alkaline extraction treatment (i.e., as recited e.g., in step (c) of claim 1), leads to a plasmolysis of the cells’ membrane. Alkaline treatment and electroporation

are considered to have the same effect and both stand as independent alternatives to thermal lysis. One of ordinary skill in this art would, thus, have no reason to combine these two lysis steps involving electroporation and alkaline extraction.

Additionally, as it is well known that electroporation is a very high energy-consuming technique, one skilled in this art had no reason to include an electroporation technique to an alkaline extraction step. Moreover, in addition one having ordinary skill in this field of art had no reasonable expectation that the combination of the steps recited in claims 1 and 18 would result in the unexpectedly improved results described at pp. 7 (last two lines) - 10 of the specification.

For all of the reasons above, therefore, the Examiner is respectfully requested to reconsider and withdraw the rejection of claims 1-4, 6-12 (*sic.* 13), 15, 16, 18-22, (*sic.* 25, 26), 27 and 28 under 35 USC 103 based on the combination of Sanders '287 and Schultheiss.

Further to the above, claims 5, 14, 17 and 23-24 are rejected in ¶20 (p.5) of the Office Action under 35 U.S.C. 103 based on Sanders in view of Schultheiss as applied to the claims as discussed above, and further in view of the Hunt et al. U.S. patent No. 4,323,007. These rejections are also respectfully traversed.

The rejected claims are all dependent claims, i.e., they depend directly or indirectly from either claim 1 or claim 18 and thus contain all of the recitations found in the claim from which they depend. For the reasons discussed above, independent claims are deemed by applicants to be distinguishable over the combination of Sanders and Schultheiss. The Hunt reference, moreover, fails to remedy the deficiencies noted above of the combination of Sanders and Schultheiss. The Office Action indicates that Hunt is included in the combination due to its disclosure with regard to a perforated extracting screw. Even, however, with the addition of this disclosure to that contained in the combination of Sanders and Schultheiss, the three references (i.e., including Hunt) taken together still would not teach, or even suggest the invention as recited in the independent claims.

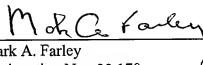
For the above reason, therefore, the Examiner is also respectfully requested to reconsider and withdraw the rejection of applicants' claims 5, 14, 17 and 23-23.

Summary

The claim amendments and arguments presented above are believed to overcome all of the grounds for rejection of applicants' claims set forth in the present Office Action. The Examiner is, thus, respectfully requested to reconsider and withdraw the subject rejections and to issue a Notice of Allowance for all of the claims of this application, as amended.

THIS CORRESPONDENCE IS BEING  
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Respectfully submitted,



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